Bandolier 45

What do we think?
What do we know?
What can we prove?

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This is a very important month for ***Bandolier***, because November sees some 6,000 new readers in the West Midlands Region. So for the newcomers, a few words about ***Bandolier.***

Bandolier is now into its fourth year. It was started as an experiment in the former Oxford Region. The idea was to give a mixed group of readers (who used to be called "purchasers") information on those things which were known to be effective, and those which were not. It set out to précis information from systematic reviews, meta-analyses and randomised trials. These "bullet points" of information are stored in a bandolier.

Bandolier was then bought by more regions for distribution, and now about 30,000 people see it every month. Our Internet site (which has all issues of ***Bandolier*** and much more besides) has over 150,000 visits to its pages every month.

Time and understanding

Most healthcare professionals are reckoned to do about 30 minutes of reading every week. So complicated statistics are out, and messages about outcomes which are understandable to professionals and public are in. The number-needed-to-treat (NNT) is a straightforward way of presenting information about desirable clinical outcomes of treatments, and ***Bandolier*** uses it a lot. A whole issue of ***Bandolier*** was given over to the calculation and use of NNTs (***Bandolier*** 36).

In this issue NNTs have been used in a review of homeopathy, on a nurse-led intervention to prevent subsequent readmission in childhood asthma, and for an intervention to prevent homelessness.

Trying new things

Bandolier is certain only that it doesn't know enough. There must be better ways of doing things. In diagnosis, the use of likelihood ratios rather than sensitivity and specificity has helped concentrate the mind in making diagnoses. There isn't a huge amount of information out there, but this month we review some information on diagnosing anaemia.

Then again, how do you get over the idea of risk to people? There is a suggestion on page 6. But it is a suggestion, and ***Bandolier*** encourages correspondence from readers, and participation in seeking better ways forward.

Signpost

Bandolier does not see itself in any light other than being a signpost - suggesting good routes to better practice. We do hope to be a reflective signpost, though, and try to respond to readers' suggestions and comments.

Teaching evidence-based healthcare

The Joint Department of Primary Care & Population Sciences at UCL and Royal Free Medical Schools are pleased to announce the 7th UK Workshop on Teaching Evidence-Based Health Care on 9th - 13th February 1998 organised by Dr Trish Greenhalgh. Based on the model developed at McMaster University Canada, and introduced into the UK by Professor David Sackett, the course offers delegates the chance to learn, and to learn how to teach others, the skills of evidence-based health care in tutor facilitated small groups.

Previous workshops have been heavily overbooked so please apply early to be sure of a place. For further details and an application form please contact the Workshop Administrator on any of the following:

email: ebp@ucl.ac.uk
Fax: +44 (0)171 281 8004
Department of Primary Care, Archway Site, Whittington Hospital, London N19 5NF

Research Appraisal Group

The North Thames Research Appraisal group (NTRAG) is a mixed group of researchers, academics and clinicians interested in promoting EBHC through the teaching of critical appraisal skills. It provides a wide range of workshops focusing on the critical appraisal of research. Many activities are delivered on-site at Trusts and Health Authorities, allowing tutors to link their teaching directly to local issues and priorities. If you are interested in joining the tutor team, contact the project administrator, Jenny Bacon, for an information pack.

Tel: 0171 830 2549 Fax: 0171 794 1224
email: ntrag@rfhsm.ac.uk

In this issue

HOMEOPATHY - DILUTE INFORMATION AND LITTLE KNOWLEDGE

The effectiveness of complementary medicine (whatever that means exactly) and its place in alongside other healthcare services is one that continues to perplex. Arguments are usually unencumbered by evidence. But for homeopathy a new analysis [1] of placebo-controlled studies gives an insight into the effectiveness of this intervention.

Klaus Linde's team have done a great job of finding all the trials, and looking for factors which may have led to overestimations of treatment effect through publication bias and other forms of bias. The headline result - that on balance homeopathy works - may be presented by others in a more positive light than the conclusions reached by the team - "The results of our meta-analysis are not compatible with the hypothesis that clinical effects of homeopathy are completely due to placebo" and "..we found insufficient evidence from these studies that homeopathy is clearly efficacious for any single clinical condition".

What they did

They sought all the trials on homeopathy, in any condition and with any homeopathic remedy at any dilution, which fulfilled the following inclusion criteria:

1. Controlled studies
2. Parallel group design
3. Randomised, or with descriptions of double-blinding that meant they had to have been randomised
4. Written reports (including abstracts, theses etc)
5. Had data on outcomes that could be extracted for data analysis.

They found

Eighty-nine trials could be analysed. They broke down like this:

- The median number of patients studied in each trial was 60.
- There were 24 clinical categories.
- There were four types of homeopathy.
- There were 50 classes of homeopathic remedy.

So clearly this was not a particularly homogenous bunch of trials. The number of trials in each clinical class, and the number where homeopathy beat placebo are shown in the table. Overall, homeopathy beat placebo in only 42% of the trials. So one conclusion was that in 6 out of 10 trials, homeopathy could not be shown to have any benefit over placebo.

This might be seen by some as more instructive than odds ratios, which are the results we are given in the paper. ***Bandolier*** has always had trouble with mere statistical outcomes, but in the main that is all we have here. For the record, the odds ratios favoured homeopathy. The odds ratio was 2.5 (2.1 to 2.9) for all 89 trials, though lower at 1.7 (1.3 to 2.1) for high-quality trials.

Trials in Homeopathy

Clinical class	Number of trials: Total	Number of trials: Homeopathy beats placebo
Allergy	7	4
Dermatology	9	3
Gastroenterology	9	3
Musculoskeletal	6	2
Neurology	7	4
Obstetrics & Gynaecology	10	5
Chest infection, asthma, ENT	15	4
Rheumatology	7	4
Surgery & Anaesthesia	12	4
Miscellaneous	7	4

Special cases

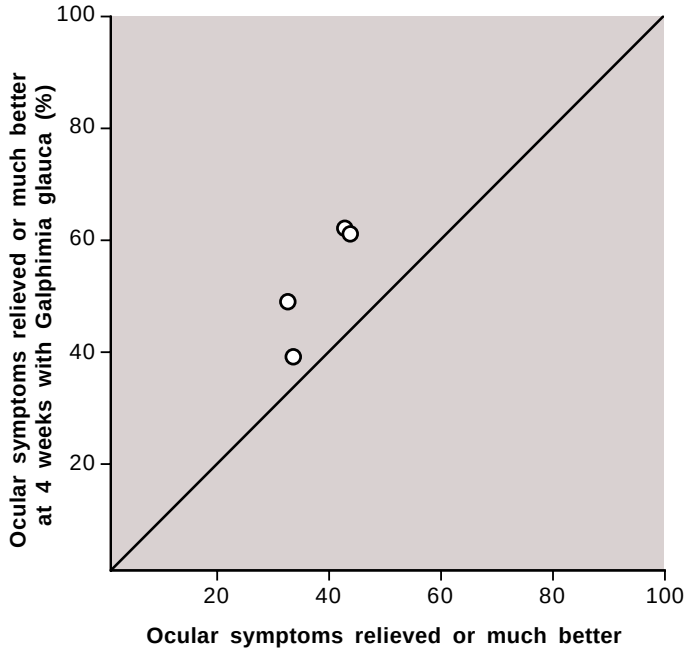
There were two circumstances in which there were similar outcomes and conditions, though predominantly with different homeopathic interventions. For one of those ***Bandolier*** could extract information for NNT calculations.

For patients with ocular symptoms from allergic disorders relieved or much better with Galiphimia glauca at four weeks, the relative benefit was 1.4 (1.2 to 1.6) and the number needed to treat (NNT) was 6.6 (4.4 to 13). This means that for every seven patients treated with Galiphimia glauca for four weeks, one will have ocular symptoms improved or relieved who would not have done had they been treated with placebo.

Comment - double standards?

This is an important paper because it applies good meta-analytic principles to a difficult subject in complementary therapy.

Effect of Galphimia glauca on ocular symptoms compared with placebo



It examined all comparisons of homeopathy against placebo, and because there was a statistically significant outcome, this will be interpreted by some as "homeopathy works".

Well maybe. But there just is not enough information in any one condition with any one homeopathic treatment to say that homeopathy should be used. If this were a new treatment in conventional healthcare, we would look at it with a very cold and fishy eye. Certyainly no conventional therapy would be allowed to have so many different conditions and variations bundled toegether to try to reach a conclusion.

A sceptical reader might say "If this is the best they can do, why bother?" - but ***Bandolier*** couldn't possibly comment.

Reference:
1 K Linde, N Clausius, G Ramirez et al. Are the clinical effects of homeopathy placebo effects? A meta-analysis of placebo-controlled trials. Lancet 1997 350: 834-43.

PREVENTING HOMELESSNESS

Randomised controlled trials of social interventions are rare, so ***Bandolier*** was delighted to spot a well-conducted trial looking to prevent recurrent homelessness in mentally ill men in New York [1]. This is a detailed paper with a wealth of information about its conduct, so for those who are interested, then it comes into ***Bandolier's*** "must-read" category.

Subjects

The study population was 102 men discharged to housing in New York City region in 1991-93. Of these, 96 agreed to participate in the trial. All the men had severe mental illness, usually schizophrenia or other psychotic disorders. They were discharged from an on-site psychiatry programme in a mens' shelter, to return to community housing. They had access to a broad spectrum of supportive housing, from intensively supervised residences to single-room-occupancy hotels with on-site social services. But discharge to family, or friends or other arrangements was common.

Intervention

Randomisation was between usual services only (USO), and a critical time intervention (CTI). The critical time was defined as the first months after discharge, and the intervention included a range of services (Table) provided by a CTI worker (no special skills, though supervised by a mental health professional). The CTI workers were "street smart", and gave as much as was needed by individual patients.

Outcome

The main outcome was the number of homeless nights (not including nights when patients decided not to go home because they had other things to do). This was assessed by monthly face-to-face assessments conducted by assessors blind to the intervention. This was continued monthly for 18 months.

Results

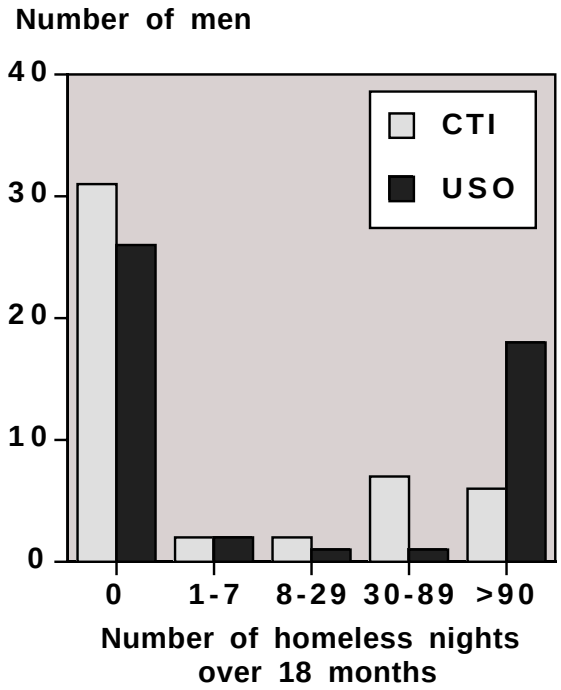
Two men, both in the USO group, were lost to follow up, one who was fleeing drug dealers and one who committed suicide on becoming HIV positive. There were no differences between the groups, and cocaine and alcohol abuse was high (about 50%).

Overall the 48 men in the USO group had 4370 homeless nights, compared with 1415 in the CTI group. Over 18 months (548 nights), the average number of homeless nights was higher at 91 in the USO group than the 30 nights of the CTI group. Fewer men had extended periods of homelessness with the critical time intervention (Figure overpage).

Services received by mentally ill men discharged to the community

Months after discharge	CTI group	USO group
	CTI workers:	Shelter staff:
1-3	Make home visits	Assist patients and caregivers on request
	Accompany patients to appointments	Substitute for caregivers when necesary
	Meet with caregivers	
	Substitute for caregivers when necesary	
	Give support and advice to patient and caregivers	
	Mediate conflicts	
	Negotiate ground rules for relationships	
4-7	Observe trial of ground rules	Services provided by community
	Help modify ground rules as necessary	Phone advice for patient or caregiver
8-9	Reaffirm ground rules	
	Hold parties/meetings to symbolise transition	
10-18	Usual services	

Effect of critical time intervention on homelessness (48 men/group)



During the last month of the 18-month follow-up, only 4 men in the CTI group were homeless, compared with 11 in the USO group - relative risk 0.36 (0.12 to 1.06), NNT 6.9 (3.5 to 284). Extended homelessness (more than 54 nights) occurred in 10 men in the CTI group and 19 in the USO group - relative risk 0.53 (0.27 to 1.01), NNT 5.3 (2.7 to 130).

Comment

This was a small trial in terms of numbers, but a big trial in terms of care taken during a prolonged follow-up. It demonstrates a strategy shown to be effective - preventing one case of homelessness for every five receiving the intervention. It was directed specifically in the prevention of homelessness in mentally ill men, in social conditions likely to be much worse than those prevalent in the UK. Those involved in healthcare and social services - in provision of services and in policy-making - would profit from reading this paper.

Reference:

1 Preventing recurrent homelessness among mentally ill men: a "critical time" intervention after discharge from a shelter. American Journal of Public Health 1997 87: 256-62.

Bandolier 2nd Annual

The second ***Bandolier*** volume of collected issues (21 - 34) is available by sending a cheque for £14 made out to **Oxfordshire Health**, to:

Mrs Eileen Neail, ***Bandolier***, Pain Relief
The Churchill, Headington, Oxford OX3 7LJ

The only way you can get this collector's item is to send a cheque with order. Overseas orders (£18) and credit card sales can be made through Hayward Medical Communication Ltd. Contact Angie Stagg on +44 1638 751517 (fax) or hayward.newmarket@dial.pipex.com (email).

Childhood asthma

Children with asthma are commonly admitted to hospital following acute attacks. Asthma re-admissions are also common, and re-admission within a year may occur in 20-25% of children who already had one admission. Clearly this is distressing to the children, their parents or carers, and produces a considerable load on hospital emergency departments.

A meta-analysis of home management training programmes [1] concluded that these programmes do not seem to reduce morbidity. So what is to be done? A study from Glasgow [2] investigated a nurse-led home management training programme instituted when a child is admitted to hospital with an acute attack.

Randomised trial

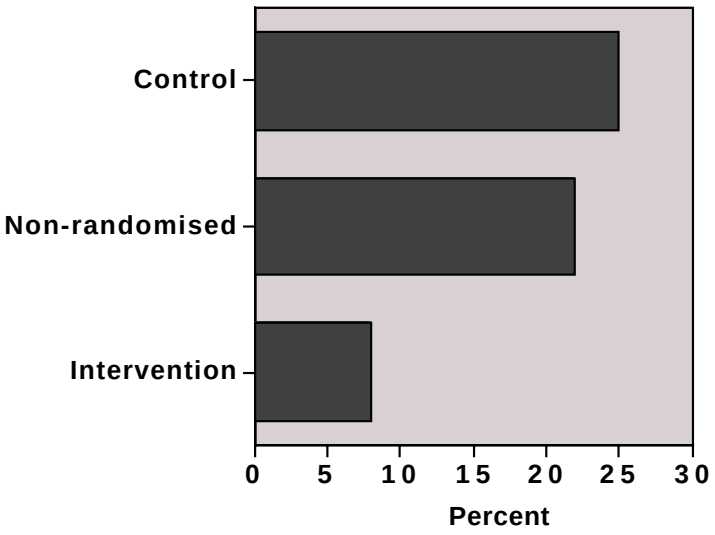
Children admitted to the Royal Hospital for Sick Children with acute asthma were randomised to usual care, or to an intervention where a nurse met parents briefly within 24 hours of admission, and followed that with two teaching discussion sessions lasting about 45 minutes in total. These meetings were centred on a booklet, "Going home with asthma", developed specifically to provide basic practical advice. In particular the symptoms and signs identified by the parent as preceding the child's present attack were used as the basis of individualised symptom-based asthma management plan. A further appointment 2-3 weeks after discharge was used to reinforce messages, and telephone advice was also available.

Each family was given oral steroids to take home, with guidance on when to use them. Children over five years could also use a peak flow meter in addition.

Outcomes

The main outcome was return to hospital - any subsequent asthma admission. Secondary outcomes were asthma morbidity - a questionnaire sent to families to assess asthma symptoms four weeks after discharge from hospital.

Readmission to hospital over 2 to 14 months



Results

Over a year 283 children over two years were admitted (from a population served of 173,000 children under 14 years, an incidence of admissions of 164/100,000 children aged 2-14 years).

The control group of 105 children had 26 readmissions (25%). A non-randomised group of 82 children (who were admitted when the nurse was unavailable) had 18 readmissions (22%). The intervention group of 96 children had 8 readmissions (8%). At four weeks after discharge the intervention group had significantly lower day and night morbidity scores. The intervion had a NNT of 6.1 (3.8 to 15), meaning for every six families who received nurse-led advice, one less child was subsequently admitted to hospital.

Comment

This was a fine study with a thoughtful discussion. Yes, it was one trial, and, yes, there was only one nurse. So the results may not be universally applicable. But it is a great example of how to change practice, to see whether the change is effective, and if it is, to set audit standards to see that it remains effective.

References:
1 A-C Bernard-Bonnin, S Stachenko, S Bonnin, C Charette, E Rousseau. Self-management teaching programmes and morbidity of paediatric asthma: a meta-analysis. Journal of Allergy and Clinical Immunology 1995 95: 34-41.
2 P Madge, J McColl, J Paton. Impact of a nurse-led home management training programme in children admitted to hospital with acute asthma: a randomised controlled study. Thorax 1997 52: 223-8.

Putting risks into perspective

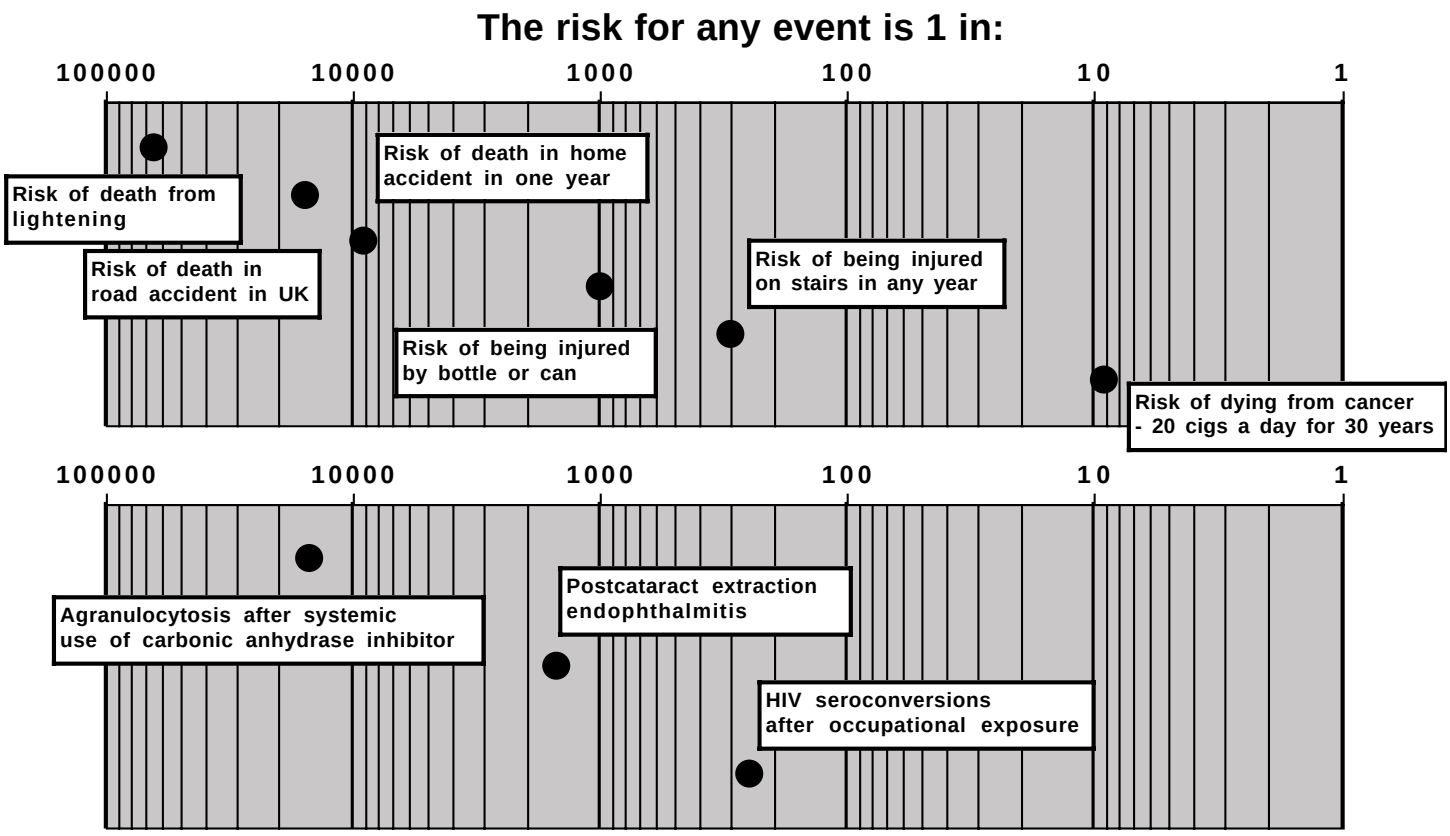
Bandolier has for some time been interested in making sense of risk or chance. There is an interesting paper [1] which suggests using the Paling perspective Scale as a way of doing this.

The idea is that a scale of risk of events of interest are presented, together with some ideas about risks of life events, like that of being killed by lightening or in a road accident (which most of us think of as being remote), as well as more common risks. The risks of any particular event associated with a treatment can then be placed alongside - if, that is, the outcomes and timescales are generally similar. And this is something useful for irreversible events rather than adverse effects of treatment which go away when you stop taking the tablets.

An example is shown below, with information drawn from the paper. ***Bandolier*** does not think this is a particularly good example, because we've just taken some examples from the paper and John Paling's book. This is something which needs work, and getting good information on risks isn't easy to get hold of.

In the course of the next few months we intend to see if we can get hold of more and better information, and with feedback from our readers see if we can tweak this to make it more satisfactory. Those who are not electronically challenged (that is who have an Internet connection) will be able to visit a website for this. We'll give the address in a later issue.

Reference:
1 AD Singh, J Paling. Informed consent: putting risks into perspective. Survey of Ophthalmology 1997 42: 83-6.



DIAGNOSING ANAEMIA

Bandolier is always on the lookout for good papers which help in making a diagnosis. A number of papers on the diagnosis of anaemia have come our way this month. Interestingly, they include the issues of clinical evaluation, and of laboratory diagnosis.

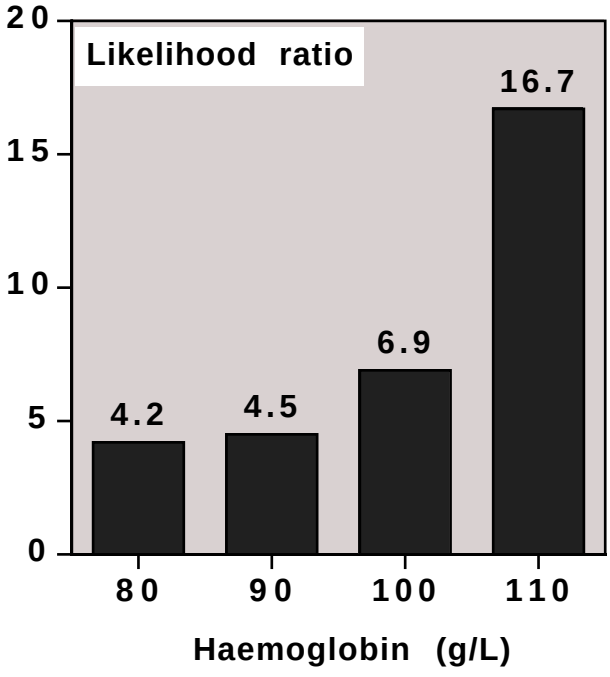
Conjunctival pallor

Dr Findlay could always diagnose anaemia by just looking at a patient's nails, or pulling down an eyelid and seeing conjunctival pallor. But how good is conjunctival pallor, or its absence, in predicting anaemia? A study from Toronto tells us [1].

A total of 302 inpatients were examined who were over 18 years of age, able to consent and willing to participate and who had a haemoglobin measurement taken within three days of assessment of conjunctival pallor (but no transfusion in between). Three observers examined them for conjunctival pallor - after an initial 25 patients were seen to agree definitions. Pallor was described thus:

- Pale conjunctiva were those with very little or no evidence of red colour on the anterior rim, which matched the fleshy colour of the posterior aspect of the palpebral conjunctiva.
- Conjunctivae that were normal had full or nearly full redness of the anterior rim.
- Borderline conjunctivae were those with neither clearly red nor clearly pale anterior rims, or those in which one conjunctiva was pale and the other was normal.

Likelihood ratios for prediction of anaemia by conjunctival pallor at different haemoglobin levels



Results

Of the 302 patients, 55 (18%) had Hb levels of 90g/L or below. Of the 55 with Hb ≤90 g/L, 8 had conjunctival pallor, and 22 had borderline pallor. So on this basis, the results were modest, with a likelihood ratio for the presence of conjunctival pallor of 4.5 (95% confidence interval 1.8 to 11), and a likelihood ratio for the absence of pallor of 0.6 (0.4 to 0.8).

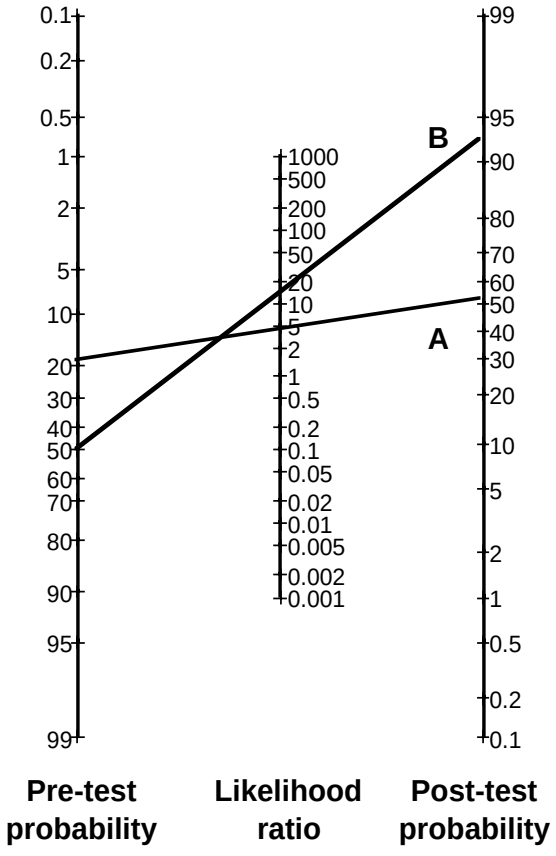
However, a post-hoc analysis using different haemoglobin cut offs found that the presence of conjunctival pallor was highly predictive of a Hb value of below 110 g/L (figure). But neither borderline pallor nor absence of pallor were particularly helpful at any level of Hb - with likelihood ratios close to 1.

Useful information?

Yes it is. Given that 18% of patients in this Toronto hospital (including those with cancer and HIV) had Hb values of 90 g/L or below, and 47% had values of 110 g/L or below, the presence of conjunctival pallor should at least prompt a test for haemoglobin (and probably for serum ferritin, as will become apparent in a moment). The likelihood ratios and prevalences are combined in the likelihood ratio nomogram. Using an 18% prevalence for Hb ≤90 g/L, a LR of 4.5 gives a post-test probability of about 50% (line A). Using a 47% prevalence for Hb ≤110 g/L, a LR of 16 gives a post-test probability above 90% (line B).

It also tells us that in patients where there is evidence from other signs, symptoms or history, the presence of full conjunctival redness does not exclude significant anaemia.

Likelihood ratio nomogram



And this ought to prompt some research elsewhere. This is just the sort of informative research that could be done in general practice in the UK, with large numbers of patients to tighten confidence intervals and provide results for particular patient groups. Is anyone doing it?

Serum ferritin predicts iron-deficiency anaemia

There was a great systematic review of tests to diagnose iron deficiency anaemia from McMaster published a few years ago [2]. The authors sought reports in which the target population was over 18 years with low levels of haemoglobin (<130 g/L for men and <110 g/L for women), with histological appearance of bone marrow aspirates as the gold standard criterion for diagnosis.

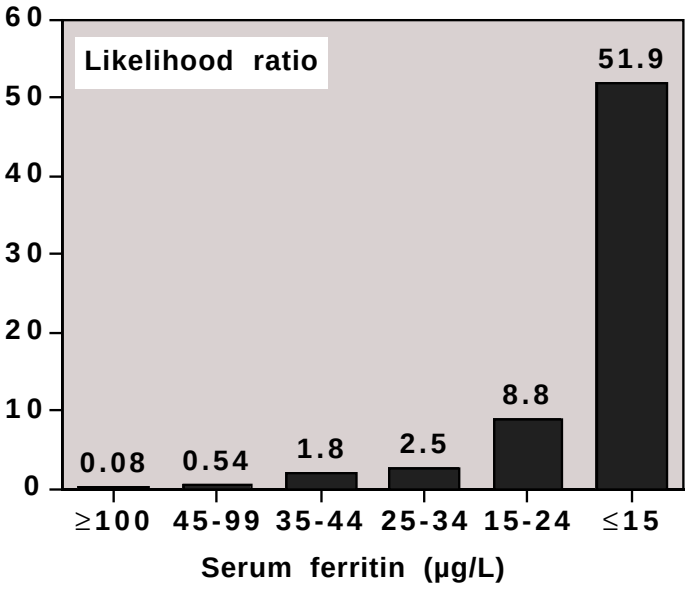
The review showed clearly that a number of tests were not up to the job - notably mean cell volume, transferrin saturation, red cell protoporphyrin, red cell volume distribution and red cell ferritin. Serum ferritin was streets ahead in terms of diagnostic accuracy.

Serum ferritin results

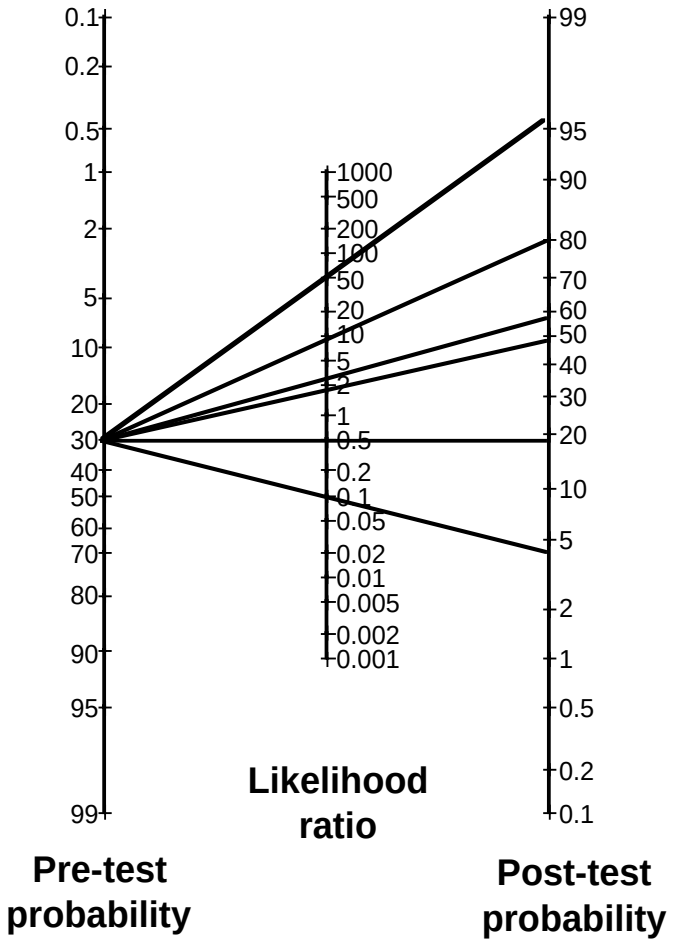
There was information on 2669 patients for serum ferritin, of whom 809 (30%) were iron deficient. Likelihood ratios were calculated for patients with inflammatory diseases, and with non-inflammatory disease, but in the Figure below the combined results are given for likelihood ratios calculated at different serum ferritin levels.

How these might be used for a patient is shown in the likelihood ratio nomogram. Using a 30% figure for a pre-test probability (obtained here from prevalence, but it might just as easily come from clinical experience or history), post-test probabilities from serum ferritin of ≥100 µg/L down to ≤15 µg/L are 4, 20, 50, 60, 80 and >95% respectively. Other ways of using these data are explored in the book by David Sackett and others on how to practice and teach evidence-based medicine [3].

Likelihood ratio for iron deficiency anaemia by serum ferritin concentration



Likelihood ratio nomogram



Comment

There is some instructive material beginning to be produced on more rational and insightful ways of using diagnostic tests. We still lack a number of really good examples where clinical experience, clinical history, and diagnostic tests can be combined to provide a rational diagnostic process. The key has to be an incremental approach in which simple and immediate tests are used first to increase the probability of the diagnosis. More complicated and costly tests can then be used to conclude the process. For aficionados of diagnostic testing, there is another interesting paper to read [4].

References:

1 TS Sheth, NK Choudhry, M Bowes, AS Detsky. The relation of conjunctival pallor to the presence of anaemia. Journal of General Internal Medicine 1997 12: 102-6.

2 GH Guyatt, AD Oxman, M Ali et al. Laboratory diagnosis of iron-deficiency anaemia: an overview. Journal of General Internal Medicine 1992 7: 145-53.

3 DL Sackett, WS Richardson, W Rosenberg, RB Haynes. Evidence-based medicine: How to practice and teach EBM. 1997 Churchill Livingstone, ISBN 0-443-05686-2.

4 C Patterson, GH Guyatt, J Singer, M Ali, I Turpie. Iron deficiency anemia in the elderly: the diagnostic process. Canadian Medical Association Journal 1991 144: 435-40.

HTA REPORT

Near patient testing in primary care

Reviewed by Jonathan Kay

This review is one of the first products of the Health Technology Assessment Programme which aims "to ensure that high-quality research information on the costs, effectiveness and broader impact of health technologies is produced in the most efficient way for those who use, manage and work in the NHS". Throughout my entire career in clinical biochemistry this has been a subject which has generated vast amounts of heat and I came to this review looking for illumination. Even its title is controversial with "Near Patient Testing", "Extra Laboratory Testing" and "Point of Care Testing" competing in the marketplace of ideas. More importantly the brilliant and rapidly advancing technologies which can be used for this purpose usually depend on the consumption of expensive materials with very little interchangeability between those produced by different suppliers, and operated by staff with little background in analytical chemistry. The risks are obvious (see ***Bandolier*** 3 and 19)

Where's the beef?

The method used in the review is that of a qualitative systematic review. The rigour of this can be seen in the allocation of space within the report. In a total of 231 pages, 137 are allocated to the systematic review summary tables with each paper analysed under pre-defined headings. Another 35 pages comprise an analysis of the top scoring papers. The style used follows the constraints of evidence based medicine. With the experts who wrote the assessment and the enormous amount of work that has gone into it, I read it avidly looking for the denouement, but the authors seem to avoid one, ending coolly with the first major conclusion that there is little evidence to support the general introduction of NPT into general practice.

I was looking for more than this: with the enormous commercial pressures to introduce near patient testing I was looking for more detailed questions which would enable someone considering this option to make a rational decision. Clearly the decision would differ between different possible analyses and, more importantly, different clinical situations. Being told that further evaluation is needed falls short of this.

One of the widely quoted advantages of near patient testing is the rapid availability of reports. Although some of the relevant factors in this area are mentioned, including patient satisfaction, immediate availability of results and the value of traditional laboratory procedures in playing for time, the general issues involved in assessing the required turnaround time of laboratory results are not discussed in detail. These would need to include the assessment of value of information at times after the patient has left the consultation and the ease of communication after the consultation.

The review intelligently includes the study of computerised decision support systems and electronic data interchange for the transmission of reports where analyses are not carried out in the primary care setting. Again the unwillingness to go beyond what is in the published literature creates a weakness here. Electronic data interchange has the unique property of laboratory reports automatically appearing in a computerised patient record without re-keying, a property which is quite independent of its comparison with other methods of communication in terms of speed of transmission. Similarly, the fragmentation of lots of longitudinal population based records for laboratory reports which would follow wide-scale devolution of laboratory investigations away from central laboratories and towards primary care is not discussed. The risk of this is obvious without any publications on the subject.

Making rational decisions

The review does not remark on the inadequacy of our current natural language for making rational decisions in this area. The worst example of this is the ambiguity of the word "test" between the meanings of "investigation carried out" and "the procedure used to gather information about a patient or decide what action to take next". Only when there is a useful test in the second sense is it appropriate to ask where and how the chemical analysis should be carried out. Unfortunately the potentially unholy alliance of pressure from manufacturers and patients inevitably leads to too many tests (in the former sense) being carried out.

This review is an outstanding achievement, but I think it should have gone further in providing guidance to those currently making decisions concerning the use of this technology. It will have three great uses for managers and practitioners in this field: as a source of the highest quality of information; as a criticism of the historically poor way in which evaluations have been carried out, both within the NHS and by workers in the field; and in assisting in constructing a set of questions, based on those used in the systematic review, which will improve the quality of future publications.

Dr Jonathan Kay is a Consultant Chemical Pathologist at the Oxford Radcliffe Hospital. He was a member of the ACB Working Group on Near Patient Testing and with Dr John McVittie was responsible for the introduction of clinical electronic data interchange between Primary and Secondary Care (http://oxmedinfo.jr2..ox.ac.uk).

FDR Hobbs et al. A review of near patient testing in primary care. Health Technology Assessment 1997 1: No 5.

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